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 TI DGO formation by lateral oxidation  
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 CS USA  
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 DT Journal; Patent  
 LA English  
 CC 76 (Electric Phenomena)

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| PI | IP 8808D |  | 20020715 |  |
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| PRAI | IP 2002-8808D | 20020715 |  |  |
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AB Silicon dioxide (SiO<sub>2</sub>) has been the MOSFET gat dielec. of choice over other dielecs. because of its phys. and elec. properties. However, as MOSFET dimensions are scaled, the gate leakage **current** becomes unacceptably high when the SiO<sub>2</sub> is scaled to a thickness range where direct tunneling is the primary conduction mechanism. To achieve a lower leakage **current** at the same equivalent oxide thickness (EOT), the SiO<sub>2</sub> can be replaced with a thicker dielec. that has a higher permittivity. Metal oxide insulators such as zirconium dioxide (ZrO<sub>2</sub>) and hafnium dioxide (HfO<sub>2</sub>) are examples of two dielecs. with permittivities higher than SiO<sub>2</sub>. To form a metal oxide with an extremely low elec. oxide thickness (tox), it is extremely important to control the surface preparation. The ability to scale down the thickness of a metal oxide will be limited by the quality and thickness of any surface oxide or pretreatment. Thus it is desirable to remove the native oxide on the surface prior to formation of the metal oxide gate dielec. Two methods for removing a native oxide are HF cleaning and hydrogen baking at elevated temps. On a chip, it is desirable to have MOSFETs with different gate dielec. thickness to address the needs for high and low voltage operation. A thin gate dielec. is used for the high performance device that is operated low voltages whereas a thicker gate dielec. is used for MOSFETs that are operated using high voltages. The presence of two such different dielecs. is referred to as a Dual Gate Oxide (DGO).

|   | Type | L # | Hits  | Search Text  | DBs                                   | Time Stamp          |
|---|------|-----|-------|--|---------------------------------------|---------------------|
| 1 | BRS  | L1  | 1157  | (sensor or biosensor) and (via or (throughhole or (through near1 hole))) near3 (electrode or lead))                                | EPO;<br>JPO;<br>DERWEN<br>T           | 2004/06/15<br>16:09 |
| 2 | BRS  | L2  | 21128 | (enzyme or oxididase or oxidoreductase or dehydrogenase or ion or cation or anion) and electrode and (plate or substrate or strip) | EPO;<br>JPO;<br>DERWEN<br>T           | 2004/06/15<br>16:08 |
| 3 | BRS  | L3  | 2428  | 2 and (sensing or sensor or biosensing or biosensor or measuring)  | USPAT;<br>EPO;<br>JPO;<br>DERWEN<br>T | 2004/06/15<br>16:08 |
| 4 | BRS  | L4  | 2428  | 2 and (sensing or sensor or biosensing or biosensor or measuring)  | EPO;<br>JPO;<br>DERWEN<br>T           | 2004/06/15<br>16:08 |
| 5 | BRS  | L5  | 2394  | 4 not 1  | EPO;<br>JPO;<br>DERWEN<br>T           | 2004/06/15<br>16:08 |
| 6 | BRS  | L6  | 154   | 5 and (via or (throughhole or (through near1 hole)))   | EPO;<br>JPO;<br>DERWEN<br>T           | 2004/06/15<br>16:24 |
| 7 | BRS  | L7  | 258   | 5 and (plug or connector or lead)  | EPO;<br>JPO;<br>DERWEN<br>T           | 2004/06/15<br>16:24 |
| 8 | BRS  | L8  | 232   | 7 not 6  | EPO;<br>JPO;<br>DERWEN<br>T           | 2004/06/15<br>16:24 |